

LIMITATION OF AIR ARMAMENTS

by

DAVID WOODWARD

with the aid of the Research Staff of the Foreign Policy Association

1 1 1

THE INFLUENCE OF AIR POWER ON WARFARE

TO understand the basic factors involved in the limitation of air armaments and the problems which must be solved before limitation can be carried out, it is essential to know something of the part which aviation authorities now expect aircraft to play in modern warfare, the lines upon which aircraft development is proceeding and the organization of the air forces of the principal powers. This report, therefore, deals with these questions before reviewing the efforts which have been made toward the limitation of air armaments by international agreement.

AIR POWER AND THE NON-COMBATANT

That the airplane has introduced a new element into warfare virtually all writers on the subject are agreed. On the effect of this new instrument, however, there is the greatest disagreement. It is impossible to discuss here all of the predictions which have been made or to draw conclusions regarding their worth. It may be said, however, that an impressive number of authorities who have been associated intimately with the development of aviation in different countries believe that the use of aircraft will bring with it the destruction of cities and the wholesale slaughter of civilian populations. Thus, Mr. Edward P. Warner, a former American Assistant Secretary of the Navy for Aeronautics, recently declared that "there is hardly a city in all of western or central Europe which could be considered safe from direct attack by air from within the territory of some potential enemy in the event of war. . . The most serious of its [the airplane's] ef-

fects upon the conduct of war, however, is the prospect that it brings of the termination of the immunity of civil population. The prospect of attack upon centers of civilian population is one that is viewed with abhorrence by many military leaders. Nevertheless, it is the prevailing belief that there can be no assurance against such attack in view of the great possible military advantages and that in a long and hard war in the future, if not indeed in every outbreak of hostilities, such raids as were made on London . . . from 1914 to 1918 would become a daily event."¹

Certain British authorities have been even more outspoken. For example, Sir Samuel Hoare, former Secretary of State for Air, stated as far back as 1925:

"It is . . . probable that the critical battles of the future will be fought over great cities, and the chief sufferers will be the civilians—men, women and children. . . . In the late war some 300 tons of bombs only were dropped upon this country. Air forces of today could drop the same weight in the first twenty-four hours of war, and could continue this scale of attack indefinitely. I need not dilate upon this terrible and repulsive picture."²

On another occasion the same authority said: "As Secretary for Air, the more I see of the possibilities of aerial warfare in the future, the more anxious I am to take every legitimate opportunity of making impossible developments which, if left to themselves, might destroy civilisation."³

1. Cf. e.g., Edward P. Warner, "International Aspects of Aviation," *Encyclopedia of the Social Sciences*, New York, Macmillan, 1930. Vol. II, p. 346.

2. *The Times* (London), October 17, 1925, cited by P. J. N. Baker, *Disarmament*, London, the Hogarth Press, 1926, p. 223.

3. *Ibid.*, loc. cit. Mr. Baker comments: "The responsible head of a Service Department could hardly have used more emphatic not to say alarmist language."

Another responsible head of the Royal Air Force, the late Lord Thomson, Secretary of State for Air in 1929-30, said:

"The way to win will be by the ruthless bombing of localities which in many cases will be densely populated . . . both victors and vanquished would be left with ruined cities, widespread distress among the masses of the people, hospitals filled with the maimed and mutilated of all ages and both sexes, asylums crowded with unfortunate human beings whom terror has made insane. Neither indemnities nor conquest could compensate a victorious nation for such evils."⁴

These opinions reiterate a point of view which has been expressed repeatedly in more or less sensational form by many other writers.⁵ In the view of many people it is well that this is so, for, they hold, only by impressing upon the world the terrible consequences in store will public opinion be aroused to do something effective toward insuring peace. The soundness of this view has been questioned by some who contend that the terrible consequences of air attack will actually increase tension between nations in time of crisis because of the nervousness created.

The view that air forces will be used in the future to wipe out civilian populations, thus eliminating the distinction between belligerents and non-combatants is not held, however, by all authorities. Moreover, those who dissent are not confined entirely to the "die-hard" element, found in most military services, which denies that aircraft, because of present limitations, can ever revolutionize methods of warfare. Aside from this ultra-conservative body of technical opinion, there are a number of authorities who argue that while it may be possible to lay waste cities and civilian populations from the air, it is not and will not be good military tactics. They point to the fact that it has long been possible for battleships to lay waste unfortified coastal cities and harbors, but that actually such attacks in the past have been directed almost exclusively against points of military importance. One writer declares that "warships have usually had tasks which

were militarily more important to undertake than the wrecking of the enemy's coastal towns and the destruction of his accumulated wealth within their radius of action. . . . It may well be that air forces will also have more vital missions to perform than the bombing of an enemy's cities and towns."⁷

Another argument advanced by those who question the wholesale destruction of civil populations is that tactics of this kind would only invite reprisal and have the opposite effect to that intended.

Quite apart from these differences of opinion regarding aerial offensives against non-combatant areas and populations, there is general agreement on the fundamental fact that unless some revolutionary discovery in regard to anti-aircraft defenses is made, aircraft must play a larger part in any future war than it did in the World War.

The present capabilities of aircraft, and the functions which they are now capable of performing, afford perhaps the best indication of what may be expected in the future.

AIRCRAFT IN LAND WARFARE

When airplanes first made their appearance in war (in the Turco-Italian War of 1911-1912 and in the earliest days of the World War), they were used entirely for observation or reconnaissance: that is, securing information as to the strength, disposition and movements of the enemy forces.⁹ But to check reconnaissance by the enemy it was soon found necessary to arm planes. In the earliest air engagements the combatants were armed simply with revolvers, carbines or rifles, but later machine-guns were fitted and a type of plane was evolved especially designed for attack upon enemy aircraft. This was a single-seater plane of the highest possible speed and handiness—radius of action being sacrificed to obtain these qualities. This type of plane is termed a pursuit plane or a fighter.

At the same time other needs called for

4. Lord Thomson, *Air Facts and Problems*, New York, Doran, 1927, p. 26.

5. Cf., e.g.—Lt.-Col. Vauthier, "La défense du pays contre le danger aérien," *Revue Militaire Française* (Paris), January-April 1930, and "Le danger aérien," *Revue de Paris*, May 1, May 15, 1930; also B. H. Liddell-Hart, *The Remaking of Modern Armies*, Boston, Little Brown, 1928, and Col. J. F. C. Fuller, *On Future Warfare*, London, Sifton Praed, 1928.

7. J. M. Spaight, *Air Power and the Cities*, London, Longmans Green, 1930, p. 34-35. It is pointed out on the other hand that centers of military importance, such as munitions works, are often in centers of large civilian populations.

9. Later, observation planes were used to spot for the guns—i. e., they would wireless corrections as to range, direction, etc., thereby enabling their artillery to obtain greater accuracy against definite targets.

the introduction of additional specialized types. The earliest planes had, on occasion, carried out bombing raids upon objectives a short distance behind the enemy lines, but the demand arose for larger and more powerful planes, which, fitted with two or more motors, would be able to carry the attack far into the enemy's territory. In these bombers speed and manoeuvrability were sacrificed to ability to fly long distances and to carry heavy loads.¹⁰ They usually worked at night and were little liable to attack from enemy fighters. For short daylight raids, however, a faster plane was used.

Another special type which was developed was the attack plane, called by the British the "army cooperation plane," which was designed to assist directly the operations of the troops—by bombing the machine-gunning troops and positions, reporting enemy concentrations and keeping headquarters and the troops in touch with one another either by wireless or by messages dropped from the air.

In addition to these types which existed in one form or another at the end of the World War, two others have been developed since—the transport plane, used to convey small bodies of men (about twenty), stores and wounded in such territories as Iraq, where modern communications are lacking,¹¹ and the interceptor fighter, a very fast, handy single-seater, designed to attack enemy bombers. Because this type of plane is used near its base, it has been possible to reduce its fuel capacity and to obtain higher speed and a higher rate of climb.

ANTI-AIRCRAFT DEFENSE

The organization of aerial defense includes, in addition to the types of planes already described, an elaborate system of observation and listening posts, designed to give the earliest possible warning of the enemy's approach, together with batteries

of quick-firing anti-aircraft guns, searchlights and balloon aprons.¹²

Some idea of the immense organization required for the defense of a city against air attack is given by the following description of the defenses of London at the conclusion of the World War, written in 1922 by Brig-Gen. P. R. C. Groves, former Director of Air Operations.¹³

"In 1918 the London anti-aircraft defences consisted of eleven specially trained night-flying squadrons of aeroplanes, 180 guns on the ground, in addition to a number of guns mounted upon motor-vehicles, ten balloon aprons, and a large number of searchlights. The number of aircraft was nearly three hundred, and the total number of men employed some 30,000—i. e., the equivalent of two divisions of infantry. In addition there were a number of specially prepared night landing grounds, extensive telephone installations, and a large headquarters staff to co-ordinate and direct the whole defensive organization."¹⁴

It is of course necessary to add that since the above was written anti-aircraft devices have been considerably improved; however, the essentials of the problem still remain.

So difficult are the problems of a defense organized on the order of that of London in the last war, that there is a very considerable body of thought which holds that the only really effective method of disposing of enemy bombers is to destroy them by bombing before they leave the ground.

That this, whenever possible, is the best method there is little doubt in view of the lessons of the war and of subsequent air exercises, although it must be remembered that air exercises, to an even greater degree than manoeuvres on land or at sea, suffer from a great degree of artificiality.¹⁵

AIR EXERCISES SINCE THE WAR

In the 1928 air exercises held over London, despite atmospheric conditions favorable to the defense, the attacking bombers

12. These balloon aprons are barriers of cables hung from the balloons and designed to force the enemy to ascend to a known altitude to pass them.

13. League of Nations, C.T.A.210, 1923.

14. It should be noted that although the German air force possessed 11,000 planes by the end of the war, the largest number used in any single raid over London was thirty-six.

15. As an indication of this, the following statement which preceded the official narrative of the R. A. F. exercises of 1928 is of interest: "Before giving details of the progress of the air exercises it is desired to point out that in peace-time exercises aircraft are not shot down and umpires cannot decide which aeroplanes have been destroyed until afterwards. Further, bombers officially shot down continue on their courses to the targets, and a deceptive impression of the strength of the defences is created, unless the umpires' subsequent decision is taken into consideration." *Flight* (London), August 16, 1928.

10. Before the introduction of their Gotha bombers, the Germans employed Zeppelins for this purpose over England, but gradually airplanes replaced the dirigibles on account of the very heavy losses sustained by the latter. Cf. Capt. Joseph Morris, *The German Air Raids on Great Britain*, London, Sampson, Low, Marston, 1925; also Brig-Gen. E. B. Ashmore, *Air Defence*, London, Longmans Green, 1929.

11. In its operations against Nicaraguan "bandits" the United States Marine Corps has employed converted commercial planes for this purpose. The British troop-carriers are, however, a special type, larger than the usual air liner.

were able to carry out a number of successful raids. The Official Narrative stated:

"The weather during these exercises was unusually good, a circumstance, which, of course, favoured the defence. Fifty-seven raids were carried out, of which nine were completely successful, while raiders were attacked thirty-nine times on their way in and thirty-seven times on the way out. One hundred and fifty-one bombers were shot down by fighters, while a further twenty were destroyed by anti-aircraft guns. The bombers dropped two hundred and two tons of bombs and one hundred and thirty-nine of the fighters were shot down."¹⁶

Similar results were obtained in the air manoeuvres held by the United States Naval Air Service in the region of the Panama Canal, in January 1929. Despite the theoretical loss of the aircraft carrier *Saratoga*, and the "destruction" of a large proportion of the planes attacking, several of the survivors succeeded in theoretically closing the canal by bombing the locks at Miraflores and Pedro Miguel.¹⁷

To block the canal effectively for many months it might not be necessary, however, to secure a direct hit at all, for, in the neighborhood of Culebra Cut, the concussion of exploding bombs might well cause a collapse of the wall of the cut.

In the month of July, however, the French air service carried out elaborate sham attacks upon Lyons, with results¹⁸ which were officially described as fully satisfactory for the defense. While it was stated that no single airplane reached the city and carried out bombing without its entire course being followed throughout the raids, it by no means follows that because a plane is seen it can be prevented from reaching its target. The attacks were made, moreover, from heights lower than they probably would have been in wartime.

It is important to remember that even a single bomber which slips through may be capable of doing a great deal of damage if its half-ton or so of bombs are luckily placed. Bomb-dropping from the air may be highly inaccurate, as witness the inability of the Germans during the war to damage seriously a single target of real importance in their

numerous raids on London, but in the words of Lord Trenchard "the moral effect of bombing stands undoubtedly to the material in a proportion of twenty to one."¹⁹

This is particularly true when raids are made on industrial districts, for it is the alarms rather than the bombs themselves that decrease production, unless a direct hit is made.²⁰

AIRCRAFT IN NAVAL WARFARE

For use at sea several types of airplanes have been developed: the land or ship-plane, the seaplane, with floats instead of wheels for landing and taking-off from the water, and the flying boat with a boat hull instead of a fuselage. There is also an amphibian type which can land or take off from either water or land.

The functions of airplanes working with a fleet correspond in a general way with those of airplanes working with an army. In addition there are the torpedo planes and the big flying boat which carries out long distance patrols. All these types, except the flying boat, can operate either from shore bases or from ships, from which they may be flown or catapulted. The land and ship-planes can, however, land only upon the decks of aircraft carriers.

In the course of the World War, aircraft were employed as spotters for the bombardment of ships or shore batteries, but, with the exception of a reconnaissance at the battle of Jutland, were not used in battle. Similarly, planes from ships were used for bombing raids against shore and port objectives and against isolated ships, but had no opportunity for fleet work.^{20a}

Torpedo-dropping from airplanes was experimented with before the war and employed on several occasions during wartime, but its possibilities were not fully tested.

The part which aircraft (usually, in this case, small non-rigid dirigibles) played in the eventual checking of the submarine men-

19. Dispatch on the work of the Independent Air Force, *London Gazette*, January 1, 1919, quoted in *Air Power and the Cities*, cited.

20. Cf. B. H. Liddell-Hart, *Paris or the Future of War*, London, Kegan Paul, 1925, p. 46, and *Air Power and the Cities*, cited, p. 154.

20a. In the closing stages of the war the British Grand Fleet carried as part of the battle equipment 70 airplanes. (*Great Britain Air Ministry, Synopsis of the British Air Effort in the Great War*, H. M. Stationery Office, 1919, Cmd. 100.)

16. *Ibid.*, August 23, 1928.

17. Cf. *New York Times*, January 27, 28, 1929; also Olmedo Alfaro, *El Canal de Panama en las Guerras Futuras*, Guayaquil, Imp. Mercantil-Olmedo Monteverde H., 1929.

18. *New York Times*, July 31, 1930.

ace was not inconsiderable. Aircraft proved to be valuable for patrol duties, for, although the submarine usually succeeded in evading attack from the air by diving, the aircraft could call surface warships to the scene. Nevertheless, seven of the 199 German submarines lost during the war were sunk by aircraft.

THE EVOLUTION OF THE AIRCRAFT CARRIER

An aircraft carrier is a vessel fitted with landing and flying-off decks. A seaplane carrier is an earlier type of ship which has been largely superseded by the aircraft carrier, for it has no landing deck and must stop to pick up its seaplanes from the water; it can, however, launch planes either from a flying-off deck or by means of a catapult.

In the early days of naval flying various warships were fitted with temporary flying-off platforms from which the first flights were made. The first seaplane carrier to be built for the purpose was the British *Ark Royal*, which was laid down in 1913 as a tramp steamer, purchased by the Admiralty and converted while building. During the war, a number of small, fast railway (Channel) steamers were taken over and converted by the British Navy, and it was from one of these ships, the *Engadine*, that the first airplane to take part in a naval battle was launched at the battle of Jutland.²¹ At a later date (1918), the British cruiser, *Furious*, which had been fitted while building with a flying-off deck forward, was rebuilt with a landing deck aft, the first ship to be so fitted; she may therefore be termed the first aircraft carrier.

Other warships have been fitted to carry one or more planes, flying them off either by catapult or from special platforms. As mentioned above, however, it is impossible for these planes to land on the ships from which they have taken off.

The Washington Treaty of 1922 limited the total tonnage of aircraft carriers to 135,000 tons each for Great Britain and the United States, 81,000 tons for Japan, and 60,000 tons each for France and Italy. These tonnage limitations were incorporated in the

London Naval Treaty (1930), which also provided that not more than 25 per cent of the total cruiser tonnage could be fitted with landing platforms.

The present strengths in aircraft carriers are as follows: Britain six ships of 115,350 tons; the United States three of 76,286 tons, with one of 13,800 tons appropriated for—a total of 90,086 tons; Japan has four ships of 68,870 tons, one of which is building; France one ship of 22,000 tons and Italy none.²² This is exclusive of seaplane carriers, of which type of ship Great Britain and Japan possess two each, and France and Italy one each.^{22a}

THE AIRPLANE VS. THE CAPITAL SHIP

The extent to which the airplane has affected the place of the capital ship as the backbone of the fleet cannot be dealt with at length here. Naval experts disagree as to whether or not the capital ship has been rendered obsolete; some hold that the airplane, small, cheap and fast as it is, will be able to inflict such damage upon a capital ship as to render it impossible for fleets to keep the seas.

The other point of view is that the capital ship has been "doomed" before—by the torpedo boat and by the mine and submarine—and that there is no reason to fear that it will not be able to survive this new foe. That it will be necessary to add to the protection of the capital ship, to increase its anti-aircraft armament and to provide airplane escorts for the fleet, they agree, but, they hold, wartime and post-war experience show conclusively the extreme difficulty of securing hits with bombs dropped from the air upon so small a target.²³

22. Cf. W. T. Stone, "The London Naval Conference," *F. P. A. Information Service*, Vol. VI, No. 6, May 28, 1930, p. 113, for details of discussion concerning aircraft carriers at the London Naval Conference.

22a. The United States possesses an aircraft tender of 11,500 tons and a mine layer of 3,800 tons, at present employed as an aircraft tender.

23. The principal post-war experiments have been those with obsolete American battleships, surrendered German warships, the target ship *Agamemnon* of the British Navy, and the experiments conducted against the U. S. S. *Washington*, an unfinished battleship of the latest type, which was scrapped under the terms of the Washington Treaty and used as a target vessel, subsequently being sunk. As examples of the results obtained, may be cited the attacks on the *Agamemnon* which while steaming at 13½ knots was attacked by twenty-four planes which dropped 114 bombs without a single hit, and upon the U. S. S. *Iowa*, which was steaming at 6½ knots and sustained two hits out of eighty bombs dropped. These vessels were not defending themselves and were steaming at very low speeds. Other experiments were carried out on very old ships,

21. In addition, the old Cunard liner, *Campania*, of 12,000 gross tons, was taken over from the shipbreakers to whom she had been sold for scrapping, and fitted as a seaplane carrier.

Further, the airplane is a comparatively fragile weapon, and is still handicapped to a great extent by weather. For defensive operations and operations in narrow seas, naval experts believe that shore-based aircraft will be extremely valuable, but for offensive warfare aircraft carriers will be essential, and to protect these carriers capital ships will be required.

THE PRINCIPAL AIR FORCES OF THE WORLD

The lessons of the World War impressed upon all nations the importance of the air arm, and its development since that time has been rapid.

THE INDEPENDENT AIR ARM OR DIVIDED CONTROL

A controversy concerning the organization of air forces has, however, gone on ever since the World War, during which Great Britain took the hitherto unprecedented step of amalgamating its military and naval air services into a unified air arm.

Since the war, Italy, France and Sweden have followed Great Britain's example. The United States and Japan, however, have retained their original systems wherein the Army and the Navy air services are entirely separate.

The chief argument of those advocating unified service is that the airplane is an entirely new weapon, operating in a new element, and that for its proper use and development it is essential that the personnel which handles it should work and be trained under conditions best suited for the new invention, rather than along lines which naval and military traditions have laid down for centuries.

The case against a unified air service is based on the contention that in major operations armies and navies cannot operate efficiently without their own air service, and that an air force by itself cannot defeat an enemy.²⁴ As far as naval aviation is con-

The development of anti-aircraft defense by the addition of anti-aircraft guns and thicker armored decks in all types of warships will of course lead to an increase in their cost and size as far as is consistent with the limitations of the Washington Treaty. This, too, tends to make it increasingly difficult to reduce by common agreement the maximum tonnage of battleships.

cerned, it is contended that a naval airman should first of all be a sailor trained to fly, rather than a flier trained to work with the fleet, for it is held to be easier for a sailor to learn the duties of an airman than for an airman trained on land to cooperate efficiently with the fleet.

The special geographical situation of each country and the particular functions which aircraft would be called upon to perform in wartime, has in many cases determined the organization of air forces. Thus the fact that an air attack on the United States would probably come from airplanes launched from ships at sea has made the coordination of aerial and naval operations of primary importance to America. For the principal European powers which are not separated from potential enemies by a wide body of water the problem is essentially one of repelling a surprise air attack, which necessitates, in the opinion of Great Britain and Italy, unified air control.²⁵

THE BRITISH ROYAL AIR FORCE²⁶

The two principal unified air services are the British Royal Air Force and the Italian *Regia Aeronautica* (the Royal Italian Air Force).

The Royal Air Force had its inception in the old military wing of the Royal Flying

which were stationary and presented incomparably easier targets.

It has been stated that it will be possible to injure battleships simply by dropping bombs alongside them, on the analogy of the depth charge, but that such attacks will be of much effectiveness is doubtful. (Cf. testimony given before President's Aircraft Board, *Aircraft, Hearings and Report*, Washington, Government Printing Office, 1925.)

24. Cf. Brig.-Gen. John Leonard Hines, former Chief of Staff, who said in evidence before the President's Aircraft

Board: "I am of the opinion that the Air Service, because of the limitations imposed by natural laws on the operation of aircraft as well as the necessity for unity of action, will always be an auxiliary arm or service. It can never by itself defeat an enemy. An Air Service is an essential element of an Army or Navy. In major operations these forces cannot operate efficiently without their own air service. On the other hand an Air Service operating separately is unable to strike such a blow as will win a decisive battle."

25. Cf. Edward P. Warner, cited, p. 347.

26. Based on an article in *Flight* (London), June 27, 1930, by Major F. A. de V. Robertson, V.D., and the *Armaments Yearbook, 1929-30*, Geneva, League of Nations. Major Robertson's article, in particular, gives an excellent account of the development and organization of the Royal Air Force.

Corps, derived originally from the ballooning companies of the Royal Engineers, and the Royal Naval Air Service.

During the World War the problem of supply to the two wings of the service became so difficult that it was determined to supplant these rivalries by the creation of the Royal Air Force, which officially came into existence on April 1, 1918.²⁷

In December 1929 the first-line establishment of the Royal Air Force was 772 machines. The personnel estimates was composed of 3,465 officers, including 127 cadets, and 28,535 other ranks.²⁸ With the exception of the Fleet Air Arm, the forces were distributed on a squadron basis for the defense of Great Britain and the Empire as follows:^{28a}

NUMBER AND LOCALITY OF ROYAL AIR FORCE SQUADRONS

	Fighters	Bombers			Army Co-operative Squadrons	Coastal Reconnaissance	Communications	Troop Carriers	Totals	Totals
		Day	Night	Torpedo Bombers						
Home										
Regular	13	8	5	1	5	3	1	....	36	47 ²⁹
Auxiliary Air Force ....	....	8	....	....	....	....	....	....	8	
Cadre .....	....	1	2	....	....	....	....	....	3	
Overseas										
Aden .....	....	1	....	....	....	....	....	....	1	22
Palestine .....	....	1	....	....	....	....	....	....	1	
Egypt .....	....	2	....	....	2	....	....	1	5	
Iraq .....	....	3	....	....	....	1	....	1	5	
India .....	....	4	....	....	4	....	....	....	8	
Malta .....	....	....	....	....	....	1	....	....	1	69
Singapore .....	....	....	....	....	....	1	....	....	1	
Total	13	28	7	1	11	6	1	2	69	69

(36)

In addition to these units, the Fleet Air Arm included twenty-four flights (March 31, 1930).^{29a} The arm was formed in 1923 following protest from the Admiralty concerning the danger of the Admiralty being without men properly trained to cooperate with the fleet. Seventy per cent of the officer (flying) personnel is composed of naval officers temporarily serving with the Royal Air Force.³⁰ It comprises the aircraft based upon aircraft carriers; the flying boat and coast based units, although they cooperate with the navy, are not part of the Fleet Air Arm.

The establishment of a squadron of single-engined machines is twelve planes. Of these, however, only nine as a rule work together; the other three being a reserve of pilots. In

addition, there is a reserve store of machines from which units are drawn to make up the establishment of these twelve planes. Squadrons employing twin-engined land-planes have an establishment of ten, while flights of the Fleet Air Arm are comprised of six planes. There is as yet no definite establishment for flying boat squadrons.

Home Based Aircraft

Home based aircraft are grouped in three commands: (1) Air Defence of Great Britain; (2) Inland Area; and (3) Coastal Area.

The Air Defence of Great Britain is divided into two areas, the Wessex Bombing Area and the Fighting Area (in addition to No. 1 Air Defence Group which is composed of the squadrons of the Auxiliary Air Force and those squadrons which have a cadre of

27: In explaining the reasons which led Britain alone of the belligerents to take this step, Mr. J. M. Spaight, in his book, *The Beginnings of Organized Air-Power*, London, Longmans Green, 1927 (page 47), says: "In France, America and Germany the point—the cardinal point on which the series of events turned—was never reached: the point, that is to say, at which the aircraft available or about to become available exceeded the needs of the armies in the field. None of these countries ever had a marginal supply of aircraft. This was the chief reason why the demand—and there was a demand in each—for an Air Ministry or an Air Department and United Air Service was unanswered."

28. Air estimates in the year 1930 (H. M. Stationery Office, London), maximum number to be borne on the Establishment, 1930. In addition, 241 officers and 1,876 airmen are expected to be borne on the Indian Establishment in 1930.

28a. Cf. *Air Annual of the British Empire, 1930*, London, Gale and Polden, 1930, p. 77.

29. A program was approved in 1923 for the establishment of the Home Defence Force of fifty-two squadrons (thirty-nine regular, six auxiliary air force and seven Special Reserve). (*Statesman's Year Book*, 1930, p. 46.)

29a. *Air Annual of the British Empire*, cited, p. 78.

30. *Monthly Air Force List*, September 1930. London, H. M. Stationery Office.

regular personnel and are brought up to full strength by the personnel of the special reserve).

The Wessex Bombing Area comprises six squadrons of day bombers and five of night bombers. The Fighting Area includes the thirteen fighting squadrons and the communications squadron.

The Inland Area comprises the five Army Cooperation Squadrons specially trained to work with the land forces and under the control of the military unit to which they are allotted, and schools and store depots. The Coastal Area includes all the flights which serve in the home waters in aircraft carriers, the flying boat squadrons, and schools and establishments which are concerned with sea-going aircraft.

In the event of war it is not contemplated that the Air Defence of Great Britain would proceed abroad, although of course the army cooperation squadrons would undoubtedly accompany an expeditionary force, and, with the present acute shortage of planes, fighting units would be sent to protect them if necessary.^{30a}

Dominion Air Forces

Australia, Canada, the Irish Free State, New Zealand and the Union of South Africa maintain small establishments which, in event of war, would serve as a nucleus from which a full-strength air force could be developed. The following table shows the strength of these units:

	<i>Officers</i>	<i>Men</i>
Royal Australian Air Force (permanent force)	110	850
(citizen force)	54	285
Royal Canadian Air Force (of these 77 officers and 266 other ranks are attached to Directorates other than R. C. A. F.)	140	581
Royal New Zealand Air Force	5	64
Royal South African Air Force	28	258
Irish Free State	22	133

Reserve Formations

In addition to the Royal Air Force Reserve, which consists both of officers and air men who have served on the active list and those who have joined direct from civil life, there exists the Special Reserve which forms part of the Home Defence Force by the side of the regular air force in event of emergency, and the Auxiliary Air Defence Force, which also forms part of the Home Defence Force, and is recruited on the same lines as the Territorial Army—the officers and men being civilians who give part of their leisure time to the work, under the instruction of a nucleus of regular officers and air force personnel.

THE ITALIAN ROYAL AIR FORCE

The second example of a unified air service is the *Regia Aeronautica*. The air forces of the Kingdom of Italy were constituted as a single arm by royal decree in August 1925, and were placed under the control of the Minister of Air. They are subdivided ac-

cording to specialization of employment, in the Independent Air Force, the Army Air Force, Naval Air Force and the Colonial Army Air Force.

The Independent Air Force is composed of eight airplane regiments of fifty-eight squadrons and one regiment of dirigibles. The Army Air Force consists of three regiments (20 squadrons), the Naval Air Force of two mixed regiments of seaplanes (13 squadrons) and the Colonial Air Force of eight squadrons.³¹

Squadrons are composed of a variable number of flights of from six to twelve planes, according to the type of machine.

Bombing flights:

- 9 machines for day bombing
- 6 machines for night bombing
- 6 hydroplanes (seaplanes)

^{30a}. Major Robertson, in his article in *Flight* already quoted, says, "The present position of the Army with regard to its air arm is so serious that it can only be justified on the grounds that no European war seems likely to break in the near future."

³¹. *Statesman's Year Book*, 1930, p. 1024.

Battle flights:

- 9 airplanes (eventually to be 12)
- 9 hydroplanes

Reconnaissance flights:

- 9 airplanes or seaplanes

The effectives of personnel stood at the following totals on October 1, 1929: Officers, flying, 1,247; non-flying, 623; total 1,870. Non-commissioned officers, flying, 1,000; non-flying, 1,774; total 2,774. Other ranks, specialist, 3,650; non-specialist, 11,300. Grand total 19,594.³²

FRENCH AIR SERVICE

The air services in France may be described as under unified control; the details of management differ, however, from those in effect in the systems of Italy and Great Britain.

Under the direction of the Air Minister, there are the Directorates of Civil Aviation and of Army Air Services, the Departments of Naval Air Forces and the Central Air Department in the Colonies, together with the colonial air units.

The total strength is fourteen air regiments and five independent air groups, but the army authorities retain command of eight regiments and five groups of reconnaissance aircraft. In addition two battle regiments may be placed at the disposal of the War Ministry upon request of that body. Approximately one-quarter of the French air units are stationed in North Africa and the Levant.

The regiments are composed of three groups of two flights each. The active planes are of the following types: 384 fighters, 200 day bombers, 120 night bombers and 730 observation and reconnaissance planes—a total of 1,434 land planes.³³ The total effectives in the French air force are not given in the *Armaments Yearbook*, which contains the official government statements.

UNITED STATES
AIR SERVICES

The United States Air Services, comprising the Army Air Corps and the Naval Air

Service, are entirely separate from one another and operate as integral parts of the army and navy respectively, the Army Air Corps, for example, ranking with the Infantry, Cavalry and Field and Coast Artillery, etc.

In 1925 President Coolidge appointed a board under the chairmanship of Mr. Dwight W. Morrow to investigate and report on the government's policy with respect to aviation. After hearing evidence from representatives of every aspect of military, naval and commercial aeronautics, the commission issued a report upon which the present organization and plans for expansion of the air services of the United States army and navy are based. The committee recommended the appointment of additional assistant-secretaries for the Departments of War, Navy and Commerce, who would be charged with the supervision of aeronautics in their own particular departments. The various suggestions which had been made for the creation of an independent air arm, however, and for a unified Department of Defense, were rejected.³⁴

In the year following, Congress approved a "Five-Year Program" for the Army and Navy Air Services to be completed by 1931. It is proposed that the total strength of the Army Air Corps should then be 1,650 officers and 15,000 enlisted men, with 1,800 serviceable airplanes, this figure to include all tactical, utility and training planes, together with those issued to the national guard.³⁵

Army Air Corps

The number and types of airplanes on hand and ordered from 1929 to 1933 for the Army Air Service plan are shown in the following table.³⁶

34. Cf. United States, President's Aircraft Board, *Aircraft, Hearings and Report*, Washington, Government Printing Office, 1925.

35. "An act to provide more effectively for the National Defense by increasing the efficiency of the Air Corps of the United States and for other purposes." H.R. 10827, *Senate Hearings before the Committee on Military Affairs*, 69th Congress, 1st Session, May 10, 1926; "Sundry legislation affecting the naval establishment 1925-26," H.R. 9453, No. 130, *House Hearings before the Naval Affairs Committee*, 69th Congress, 1st Session, p. 1176. Through a series of legislative delays, the naval program did not begin until July 1, 1927 and the army program a year later.

36. *U. S. Hearings before Sub-Committee of House Committee on Appropriations*, War Department Appropriations Bill for 1931, Washington, Government Printing Office, p. 688.

32. *Armaments Year Book*, cited, p. 555.

33. *All the World's Aircraft*, cited.

	On hand and on order, June 30, 1929	On hand and on order, June 30, 1930 (Estimated)	On hand and on order, June 30, 1931 (Estimated)	Required for 4th increment of Five Year Plan	Total requirements under the Five Year Plan
<i>Air Corps (including Organized Reserves)</i>					
Pursuit	262	296	365	365	443
Bombardment	73	115	127	134	143
Attack	68	74	90	95	99
Observation					
Standard	469	512	534	534	572
Amphibian	30	41	44	53	53
Training	361	332	276	276	276
Cargo	41	32	38	58	62
Total	1,304	1,402	1,474	1,515	1,648
<i>National Guard</i>					
Observation					
Standard	76	76	82	152	152
Transformation	20	19	16	....	....
Training	57	51	39	....	....
Total	153	146	137	152	152
Grand Total	1,457	1,548	1,611	1,667	1,800

The personnel of the Army Air Corps, as of June 30, 1929, is shown in the following table:³⁷

ACTIVE AVIATION PERSONNEL—JUNE 30, 1929

REGULAR ARMY

Total officer personnel	1,143
Officer pilots in above officer personnel	1,042
Observers	408 ³⁸
Total enlisted men in Air Corps	10,890 ³⁹

NATIONAL GUARD

Total officer personnel	328
Total number of commissioned pilots	269
Total number of commissioned observers	21
Total number of enlisted men	1,664

Naval Air Service

The United States Naval Air Service is without question the most powerful body of its kind in the world. On July 1, 1929, at the end of the second year of the five-year

program, the number of airplanes actually on hand was 829, including 162 training planes. The following table shows the number of airplanes on hand each year from 1926 to 1929, and the estimated progress from 1930 to 1932.⁴⁰

	Airplanes on Hand (June 30)				Estimated (June 30)		
	1926	1927	1928	1929	1930	1931	1932
Fighting	44	130	133	192	177	192	192
Observation	144	117	124	252	322	353	361
Torpedo	92	101	164	210	176	137	161
Patrol .....	....	....	3	5	65	103	136
Transport .....	....	....	4	8	9	11	16
Training	71	117	196	162	203	163	134
Total	351	468 ⁴¹	624	829	952	959	1,000

37. *Armaments Year Book*, 1929-30, cited.

38. All but twelve of these observers included in the 1,042 pilots.

39. Includes 403 flying cadets and twenty-four enlisted pilots.

40. *U. S. Hearings before Subcommittee of House Committee on Appropriations*, Navy Department Appropriations Bill for 1931, Washington, Government Printing Office, p. 596.

41. Three planes seem unaccounted for.

The personnel of the Naval Air Service was as follows on June 30, 1929:⁴²

ACTIVE NAVAL AVIATION PERSONNEL

June 30, 1929

Total officer personnel	715 ⁴³
Officer pilots in above officer personnel	520
Observers	11
Enlisted men in air service	10,771 ⁴³
Enlisted pilots in above enlisted personnel	289

NAVAL RESERVE AVIATION PERSONNEL

(As of September 12, 1929)

Reserve officer personnel	482
Officer pilots in above officer personnel	352
Reserve enlisted men of Air Service	733
Enlisted pilots in above enlisted personnel ..	5

JAPANESE AIR SERVICES

Japan possesses the smallest air force of the six great powers but every effort is being made to increase its strength, and its growth within the last few years has been rapid.

The Military Aviation Corps, according to the latest information available, consists of eleven reconnaissance, eleven fighting and four bombing companies—a total strength of 267 first-line machines, with a hundred per cent reserve.

The Naval Air Force comprises 108 shore-based fighting aircraft, together with seventy-eight planes in battleships and cruisers and 124 planes in carriers—a total of 310 planes and a grand total of 577 first-line fighting planes.

Following the ratification of the London Naval Treaty, which met with strong opposition from the Japanese Naval Staff, a program has been proposed for the increase of naval aviation strength, as a make-weight for the reduced strength of the fleet. The present intention is to increase the planes in the fleet to 122, the shore-based aircraft to 128 and to build a new carrier of 12,000 tons. Whether or not this program will be accepted *in toto* by the government is doubtful in view of the pressing need for economy.

RIISING EXPENDITURES ON AIR SERVICES

In recent years the rise in expenditures on air armaments by the majority of the great powers has been rapid. Great Britain

is the only power which has shown a reduction in expenditure over the past five years.⁴⁴ It is impossible, however, to make any accurate comparison of budgetary outlays, owing to differences in the accounting systems and in the defense organizations of the various countries. The official budget figures submitted by the various governments to the League of Nations and published in the *Armaments Yearbook* are not comparable. In the two unified air forces, those of Great Britain and Italy, for example, the estimates include charges for personnel, etc., which in the case of other countries are charged to the army and navy accounts. The tables which follow, therefore, are only useful in so far as they show the increases or decreases in expenditure of the four principal air powers over the past five years.

UNITED STATES^{44a}

(in thousands of dollars)

	Army	Navy	Total
1926	18,061	22,355	40,416
1927	17,107	22,556	39,663
1928	21,598	27,087	48,685
1929	27,681	33,218	60,899
1930 (Est.) ..	32,660	31,951	64,611
1931 (Est.) ..	35,823	33,258	69,081

GREAT BRITAIN^{44b}

(gross estimates
in thousands of £s)

1925-26	21,319
1926-27	19,876
1927-28	19,002
1928-29	19,135
1929-30	19,645

44. During the debate in the British House of Commons on the Air Estimates for 1930-1931, it was stated that the air expenditures of France had risen no less than 113 per cent during the last five years, that the expenditures of Italy had risen 25 per cent and those of the United States 140 per cent. Great Britain, Parliamentary Debates, *Official Record*, March 18, 1930, Col. 1943. Speech of Sir Samuel Hoare.

44a. Cf. *Aviation*, March 22, 1930.

42. *Armaments Yearbook*, 1929-30, cited, p. 908.

43. In addition, 111 officers and 1,006 enlisted men in Marine Corps Aviation.

The totals for Great Britain include contributions or "grants-in-aid" from various government departments. The largest of these is a grant-in-aid from the Admiralty which is credited to the account of the Fleet Air Arm. The net total of the Air Estimates for 1930-1931 was £17,850,000.

FRANCE^{44b}

	(in thousands of francs)
1926-27	452,821
1927-28	702,211
1928-29	795,370
1929-30	1,769,700

Prior to the establishment of the French Air Ministry in 1928-1929 charges for administration and personnel were included in the Naval and Military Estimates. This explains in very large measure the increase in 1929-1930.

ITALY^{44b}

	(gross estimates in thousands of lire)
1925-26	449,000
1926-27	719,797
1927-28	612,114
1928-29	648,720
1929-30	639,450

The expenditure for 1925-1926 was that of the Ministry of Interior for Aeronautics, prior to the establishment of the *Regia Aeronautica*.

COMPARATIVE STRENGTHS

Any survey of the numerical strengths of the powerful air services must be prefaced by a warning, for it is sometimes extremely difficult to obtain accurate figures and information. Official figures are not available for all countries and in the estimates of unofficial sources, there are in most cases the gravest discrepancies, as will be seen by a comparison of the plane totals given by different sources for some of the principal countries.

According to *Aviation* (New York) for March 22, 1930 the French possess 1,620 planes in first-line tactical units; this figure is approximate and is derived from the number of tactical units which the French record. The Air League of the British Empire⁴⁵ places the corresponding figure at 1,730 and

lists 3,000 reserve planes, making a grand total for the French of 4,730 planes. In a speech in the House of Lords on April 9 1930, Marshal of Royal Air Force Lord Trenchard, former Chief of the Air Staff, placed the French total at 1,300,⁴⁶ while the *Statesman's Year Book*, 1930, gives the French total as 1,730 first-line planes, and *All the World's Aircraft*, 1929, puts the figure at 1,434, with 700 in the first reserve and 1,400 as a war reserve.

Practically all of the sources agree on the figures given for Great Britain. Her air strength is placed at 770 or 772 planes in all sources. The Air League of the British Empire adds to a total of 772, a reserve of 520 making a total of 1,292.⁴⁸

The strength of the United States⁴⁹ is placed at 857;⁵¹ 1,463 first-line planes with a reserve of 350, making a total of 1,813;⁵² 900;⁵³ and 835 first-line planes, with a total of 1,194 machines of all types.⁵⁴

The Japanese total is put at 372 by *Aviation* and at 572 by the Air League of the British Empire, while the figures for Italy from these two sources are, respectively, 875 and 840. The latter adds 800 reserve planes, giving a grand total for Italy of 1,640 planes. *All the World's Aircraft*, the only source to give a figure for Russia, places its strength at 1,080 planes.

From these figures, despite discrepancies, it is apparent that the French air service is numerically the strongest. The American and British air services are probably close seconds, however, by reason of their very high standard of efficiency, while the American naval air force is generally regarded as the strongest in the world.

AIRCRAFT PRODUCTION
IN WARTIME

In the event of a prolonged war, the capacity for production of military aircraft by the leading powers will become of even greater importance than the number of first-line war planes which the nations possess at

46. *The Times* (London), April 10, 1930.

48. *Daily Telegraph*, London, cited.

49. It should be noted that these figures do not agree with the official statements quoted, which do not distinguish between first-line and reserve planes.

51. *Aviation*, New York, cited.

52. *Daily Telegraph*, London, cited.

53. *The Times* (London), cited.

54. *All the World's Aircraft*, 1929, cited.

44b. *Armaments Year Book*, cited, 1925-1930.

45. *Daily Telegraph*, London, January 20, 1930.

its beginning, for as pointed out during the hearings of the President's Aircraft Board, "peace time air fleets at all adequate in size for war needs can not be maintained by any nation. The great air fleets necessary for war must be produced after war begins."⁵⁵

At the end of the World War, Great Britain had some 14,000 effective planes, France 12,000, Germany 11,000 and the United States 10,000.

Comparing these figures with the air strengths of today, and taking into consideration that in wartime aircraft losses may amount to as much as 200 per cent a month,⁵⁶ it will be seen that the present totals are but a small fraction of what would be required in wartime.

The corollary to this state of affairs is that all the principal nations subsidize directly or indirectly,⁵⁷ a civil aviation industry which can be expanded for the speediest possible production of war planes, and not only does the existence of a numerous commercial air fleet result in a reserve of pilots at least partially trained for war, but also in a certain number of planes which may be converted to warlike purposes.

Five years ago, at the hearings of the President's Aircraft Board, Brig-Gen. Hugh Drum, then Assistant Chief of Staff, gave interesting details showing the possibilities of expansion of airplane manufacturing in

wartime. After stating that the average monthly output of military aircraft in the United States was between 40 and 50 planes, Brig-Gen. Drum went on to say that six months after the outbreak of a war, the production of aircraft would be in the neighborhood of 400 a month, and added the following figures for Great Britain, France, Italy and Japan.

MONTHLY OUTPUT OF AIRCRAFT

	Present output	After 6 months	After 1 year
Great Britain	50	1,800	4,000
France	100	1,000	2,500
Italy	70	300	750
Japan	35	60	100

Events since and the rapid development of the aircraft industry, especially in the United States, have made General Drum's statement very conservative indeed, as is indicated by more recent data on production in four of the world's great powers.⁵⁹

A single American factory at the close of the last war contracted to produce airplanes at the rate of 100 a day,⁶⁰ while the monthly outputs of the principal powers at the same time were as follows:⁶¹

MONTHLY OUTPUT OF AIRPLANES

Great Britain	3,500 ⁶²
France	2,600—2,700
United States	2,000
Germany	1,500—2,000

EFFORTS TOWARD LIMITATION OF AIR ARMAMENTS

THE PEACE TREATIES AND THEIR EXECUTION

The only limitations upon air armaments which have been carried out as yet have been those which the victorious Allied powers imposed upon Germany, Austria, Hungary and Bulgaria in the Peace Treaties of 1919-1920.⁶³ The disarmament clauses of the treaties concluded with these powers absolutely forbade any military or naval aviation, and prohibited the manufacture and importation of any kind of aircraft for a

period of six months. These provisions were to be enforced by an Inter-Allied Aeronautical Commission of Control. Actually the Council of Ambassadors extended this prohibition against the manufacture of aircraft

59. *Encyclopedia of the Social Sciences*, cited, Vol. II, p. 360-364.

AIRCRAFT INDUSTRY, 1929

	Number of manufacturers	Yearly output units	Value of exports in thousands of dollars
France	22	1,900	8,577
Germany	12	338	1,340
Great Britain	24	800	10,000
United States .....	...	6,034	9,178

60. *Washington Conference*, cited, p. 772.

61. *Beginnings of Organized Air-Power*, cited, p. 23.

62. The average rate of monthly production for Great Britain according to *Synopsis of British Air Effort in the Great War* (Great Britain, Air Ministry, Cmd. 100) had been only 53 from August 1914 to May 1915. In the successive twenty-one months to February 1917 it was 340, and in the ten months from January 1918 to October 1918 it reached a total of 2,668.

63. Treaty of Versailles, Arts. 198-202; 210, 313-320; Treaty of St. Germain, Arts. 144-148, 276-283; Treaty of Trianon, Arts. 100, 128-132, 139, 260-267; Treaty of Neuilly, Arts. 89-93, 204-211.

55. *Hearings of the President's Aircraft Board*, cited, p. 22.

56. *Conference on the Reduction and Limitation of Armament*, cited, p. 770.

57. The payments made by the United States on mail-carrying contracts are so great as to amount in effect to a subsidy. This is true of rates paid both to mail carriers within the United States and to those operating between the United States and Central and South America.

until 1922, pending a decision as to what constituted the difference between military and civilian planes.

The distinction between civil and military (including naval) aviation was drawn in disregard of the views of the Aeronautical Advisory Commission to the Peace Conference, which, after carefully considering the matter, had come to the conclusion that "civil aviation is very readily convertible to war purposes, and that no means can be devised to prevent such convertibility which would not, at the same time, prejudice the development of civil air transport."⁶⁴

THE NINE RULES.

Nevertheless the Supreme Council insisted upon a distinction being made, and in the autumn of 1920 instructed the Aeronautical Advisory Commission to "draw up rules to distinguish between civil aviation and military and naval aviation forbidden by the Peace Treaties."⁶⁵

The commission, referring to its original report, said that to draw these distinctions was technically impossible. The Supreme Council, however, required the commission to draw up the famous Nine Rules which subsequently were put into force on November 6, 1922. These regulations are sufficiently interesting to merit reproduction here.⁶⁶

Airplanes and Seaplanes

1. All single seater aircraft having a power in excess of 60 horsepower will be considered military and therefore war material.

2. Any aircraft able to fly without a pilot will be considered military and therefore war material.

3. Any aircraft having any of the following: armor or any method of protection, fittings for any kind of armament, guns, torpedoes, or bombs with sights for these weapons, will be considered military and therefore war material.

The following limits will be the maximum for all heavier-than-air planes and all which exceed these limits will be considered military and therefore war material.

4. Maximum ceiling at full load 4,000 meters (an engine having a super-charger will place the

aircraft in which it is fitted in the military category).

5. Maximum full load speed at an altitude of 2,000 meters 170 kilometers an hour.

6. The maximum quantity of oil and fuel (best quality aviation spirit) will not exceed 800 x 170: V grammes per horsepower, V being the maximum speed at 2,000 meters altitude with full load.

7. All aircraft capable of carrying a useful load in excess of 600 kilos, pilot, mechanic and equipment included, although the conditions of Articles 4, 5 and 6 have been complied with, will be considered military and therefore war material.

Dirigibles

Dirigibles whose cubic capacity exceeds the figures below will be considered military and therefore war material.

Rigid	30,000 cubic meters
Semi-rigid	25,000 cubic meters
Non-rigid	20,000 cubic meters.

8. Factories manufacturing aeronautical material must be declared. All machines and pilots or pupil-pilots must be registered under the regulations provided by the convention of October 13, 1919. These lists will be held at the disposal of the Committee of Guarantees.

9. The stocks of aero-engines, spare parts, and motor accessories will not be authorized in excess of that which will be considered necessary to fill the needs of civil aviation. The quantities will be determined by the Committee of Guarantees.

It is considered that the above definitions will have to be revised every two years, in order to take into account the modification which the progress of aeronautics will have made necessary.

To enforce these rules which, according to the Germans, severely crippled civil aircraft, the Allied governments established a new Committee of Guarantees with branches in Germany, France, and Great Britain.⁶⁷

Following the conclusion of the Locarno treaties (October 1925), the Allied governments agreed to abandon the Nine Rules, as well as the Committee of Guarantees. At present, while Germany is bound under the Treaty of Versailles not to maintain military or naval aircraft, the German civil air industry is one of the most important in Europe.^{67a}

66. *Revue Juridique Internationale de la Locomotion Aerienne*, 1922, p. 419. *Flight*, London, May 17, 1922.

67. Toynbee, *Survey of International Affairs*, 1920-23, p. 111. Germany consented to the establishment of this committee in a special arrangement of May 1, 1922.

67a. On January 1, 1923, in accordance with Art. 320 of the Treaty of Versailles, Germany regained a large measure of sovereignty of its air space; it used this power to ban aircraft belonging to ex-enemy nations. After the seizure and confiscation of several French planes, Germany succeeded in enforcing its decrees. Cf. Kenneth Colegrove, *International Control of Aviation*, Boston, World Peace Foundation, 1930, p. 80.

64. Brig.-Gen. P. R. C. Groves, "The Relations between Civil and Military Aviation," League of Nations Publication, *Organization for Communications and Transit—Enquiries into the Economic, Administrative and Legal Situation of International Air Navigation*, Geneva, 1930.

65. *Ibid.*

THE WASHINGTON CONFERENCE AND CIVIL AVIATION

The next occasion upon which the question of limitation was discussed was during the Washington Conference, 1921-1922, when a sub-committee on aircraft was set up to consider the problem of the limitation of air armaments. This sub-committee came to the conclusion that it was not then practicable to impose any effective limitation upon the number and characteristics of aircraft, either commercial or military.⁶⁸

In explanation of their decision, the committee stated in its report: ". . . there is one insuperable objection which is common to every method, namely the close relationship which at present exists between civil and commercial aeronautics and air power."⁶⁹

With the conclusion of the sub-committee at Washington in regard to the relationship of civil and military aircraft, however, a committee of civil aviation experts which met at Brussels in February 1927 apparently disagreed. They said:

"Every effort should be directed towards differentiating more and more clearly between civil and military aviation; in this way civil machines will become capable of a maximum economic return and will become less and less useful for military purposes."

That this differentiation is possible is challenged by General Groves,⁷⁰ for, while he believes that the small planes used for private flying, air taxi work and light commercial work generally have developed as a type entirely distinct from war planes and are of comparatively little use save as training planes and for certain auxiliary functions, by reason of their small size and power, he considers that the large air-liners are, as they develop, becoming more and more efficient as long-range night bombers.

This naturally leads to a possible division of civil aircraft into those capable of offensive action and those not so capable. General Groves' solution of the problem of limitation is to include the large air-liners as second-class bombers, thus making possible a reduction of the number of first-class or purely military bombers.

With regard to civil aviation personnel, it may be said that private and commercial flyers and commercial mechanics,⁷¹ etc., stand in much the same relation to regular personnel as do the merchant service officers and men and the private yachtsmen to the regular navy, and although they may not have received any service training must be considered a valuable adjunct. This is especially true in regard to the pilots of the big air-liners, for, as General Groves says, they may fly as much in a month as a service pilot will fly in a year. Further, civil pilots will not require the same high degree of training to work with bombers which would be necessary to bring these flyers up to the required standard for other branches of military and naval air fighting. Other additional training would of course be very much shorter than that of newly joined recruits and the pilots would be available almost immediately for such work as ferrying and instruction.

THE WORK OF THE PREPARATORY COMMISSION

The next attack upon the problem of air limitation was made by the Preparatory Commission for the Disarmament Conference of the League of Nations.⁷²

In their discussions the question again arose whether or not it is possible to limit military aircraft without also limiting civilian aviation. All the delegates except those of Germany and the United States affirmed that civil aviation was of very high potential military value; France, Italy, and six other States specifically declared: "In order to be efficient in practice, any method must provide for the limitation of military and civil aviation as a whole; the limitation of military aviation only would be ineffectual, for it could be balanced by a corresponding expansion of civil aviation."⁷³

Confronted by this difference of opinion, Sub-Commission A expressed the unanimous

71. Mechanics, of course, are transferrable *en bloc*.

72. For the general work of this commission, cf. "The Disarmament Deadlock," F. P. A. *Information Service*, Vol. IV, No. 19, November 23, 1928.

73. Report of Sub-Commission A, C.739.M.278.1926.IX., p. 111. Germany and the United States, however, held that civil aviation as such "is of comparatively little value as a possible war armament." These two States, together with several others, declared that it was impossible to limit civil aviation, and that moreover the commission was not competent to discuss such limitation, "on account of the economic consequences it might involve."

68. *Conference on the Limitation of Armament*, p. 752-83, Washington, Government Printing Office, 1922.

69. *Ibid.*, loc. cit., p. 780.

70. In his report already cited.

opinion that civil aircraft might play a very important part in future war, but that it was not qualified to pass an opinion upon a question which had grave political and economic consequences.

Following prolonged discussions at the Third Session of the Preparatory Commission, where differences arose as to the basis for the limitation of aircraft,⁷⁴ a draft convention was drawn up which passed its second reading at the first part of the sixth session of the commission in the spring of 1929.⁷⁵ In this convention France and the other powers surrendered their contention in favor of the limitation of civil as well as military aviation. Instead it was provided:

"The High Contracting parties shall refrain from prescribing the embodiment of military features in the build of civilian aviation material so that this material may be constructed for purely civil purposes, more particularly with a view to providing the greatest possible measure of security and the most economic return. No preparations shall be made in civil aircraft in time of peace for the installation of warlike armaments for the purpose of converting such aircraft into military aircraft.

"The High Contracting parties undertake not to require of civil aviation undertakings that they should employ personnel specially trained for military purposes. . . ."

The draft convention provides that the maximum air personnel, shall be fixed and

that airplanes in service shall be limited by number and total horsepower. The provisions do not apply to aircraft in reserve and have been criticized on this account.

During the course of the discussion an attempt was made to limit the weapons employed by military aircraft, apparently so as to safeguard the civilian population. The German delegate, Count Bernstorff, proposed that the powers "mutually undertake not to launch weapons of offense of any kind from the air by means of aircraft. . . ." This proposal was opposed by M. Massigli of France who replied that the airplane was no more dangerous to the non-combatant than the long-range gun. Count Bernstorff's proposal was not accepted.

Secondly, the draft convention provided that the parties would abstain unreservedly from bacteriological warfare, and from chemical warfare subject to reciprocity. It was pointed out by the Soviet delegate, M. Litvinoff, that this proposal did not go any further than the Geneva protocol of June 1925—but that protocol had not gone into effect by April 1929 because of failure of a sufficient number of powers, including the United States, to ratify it.⁷⁶ It is possible that this question of air limitation will again arise at the forthcoming session of the Preparatory Commission this November.

APPENDIX

Articles Relating to the Limitation of Air Armaments Drawn up at the Second Reading¹ of the Draft Convention at the Sixth Session of the Preparatory Commission*

Chapter I—EFFECTIVES.

Article A.

The High Contracting Parties agree to limit to the effectives determined in the tables enumerated below and annexed to the present Convention the effectives (land, sea and air) in service in their armed forces or in formations organised on a military basis.

III. Air Armaments.

Table I (optional).—Maximum armed forces stationed in the home country.

Table II (optional).—Maximum armed forces stationed overseas.

Table III.—Maximum of the total armed forces of the High Contracting Parties.

Table IV.—Maximum of the forces belonging to formations organised on a military basis stationed in the home country.

Table V.—Maximum of the forces belonging to formations organised on a military basis stationed overseas.

Article H.

. . . The tables relating to air armaments mentioned in Article A shall indicate, in the form of aggregate figures for officers, non-commissioned officers and men together, the maximum number of soldiers who may have completed more than α^2 years of actual service with the colours. . . .

74. For example, Britain did not wish to limit air personnel; France did. Britain wished limitation to be by number only, while France proposed limitation by total horsepower.

75. League of Nations, *Minutes of the Sixth Session*, C.195.M.74.1929.IX., p. 222. This convention has not yet been signed, and the second reading was passed subject to a number of reservations by various powers.

76. "The United States and the Saint Germain Treaties," F. P. A. *Information Service*, Vol. IV, No. 22, January 4, 1929, p. 434.

*League of Nations, *Minutes of the Sixth Session*, cited. C.P.D./175(2)., p. 222-223.

Chapter II—MATERIAL.
 Section III—Air Armaments.
 Article AA.

Each of the High Contracting Parties undertakes to limit the air material in service in accordance with the figures laid down in the following tables.

The limitation shall apply to aeroplanes and dirigibles capable of use in war employed in commission in the land, sea and air forces, or in the formations organised on a military basis.

Table A.—The maximum number and total horse-power of aeroplanes and maximum number, total horse-power and total volume of dirigibles in service in their armed forces.

Note.—Any of the High Contracting Parties who so desire may annex to Table A the following tables for limitations similar to those in Table A:

Table A (1).—Aeroplanes and dirigibles in commission in the armed forces stationed in the home country.

Table A (2).—Aeroplanes and dirigibles in commission in the armed forces stationed overseas.

Table A (3).—Aeroplanes and dirigibles in aircraft carriers.

Table B.—The maximum number and total horse-power of aeroplanes and maximum number, total horse-power and total volume of dirigibles in service in their formations organised on a military basis.

Note.—Any of the High Contracting Parties who so desire may annex to Table B the following tables for limitations similar to those in Table B:

Table B (1).—Aeroplanes and dirigibles in commission in the formations organised on a military basis stationed in the home country.

Table B (2).—Aeroplanes and dirigibles in commission in the formations organised on a military basis in overseas territories.

Article AC.

Horse-power shall be measured according to the rules (to be established by the Conference).

The volume of dirigibles to be expressed in cubic metres.

(Then follow the articles whose provisions refer to civil aviation and to chemical warfare which already have been quoted.³)

1. The reservations and observations of the various delegations regarding these texts have not been included in the present document.

2. This figure will be determined by the duration of the longest period of actual service with the colours which is in force in the conscript armies of the High Contracting Parties at the time of the signature of the Convention.

3. Cf. p. 312.

Statement of the Ownership, Management, Circulation, Etc.,
Required by the Act of Congress of August 24, 1912, of

FOREIGN POLICY ASSOCIATION INFORMATION SERVICE

Published biweekly at New York, N. Y., for October 1, 1930.
State of New York, County of New York, ss.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Esther G. Ogden, who, having been duly sworn according to law, deposes and says that she is the Secretary of the Foreign Policy Association, Incorporated, publisher of the INFORMATION SERVICE and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Foreign Policy Association, Incorporated, 18 East 41st Street, New York City.

Editor—Raymond Leslie Buell, 18 East 41st Street, New York City.

Managing Editor—None.

Business Managers—None.

2. That the owner is:

Foreign Policy Association, Incorporated, the principal officers of which are: James G. McDonald, Chairman; Esther G. Ogden, Secretary; both of 18 East 41st Street, New York City; and Albert Lytle Deane, Treasurer, 1775 Broadway, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

FOREIGN POLICY ASSOCIATION, Incorporated.

By ESTHER G. OGDEN, Secretary.

Sworn to and subscribed before me this 1st day of
October, 1930.

[Seal]

CAROLYN E. MARTIN, Notary Public.

New York County, New York County Clerk's No. 481.
Reg. No. 9586. (My commission expires March 30, 1931.)